

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow.

Interview Summary

Applicants wish to thank Examiner George Wyszomierski for conducting the interview of July 16, 2009. In accordance with the request in the Interview Summary that the Applicant file a statement of substance of the interview, please be advised that the Interview Summary accurately summarizes the interview.

Information Disclosure Statements

Applicants respectfully note that the PTO has not considered reference A3 listed on the Information Disclosure Statement form SB/08 submitted by Applicants on November 12, 2004. In the Office Action of June 20, 2007, the PTO crossed off reference A3 and included an annotation noting that no English abstract was provided and that the PTO could not locate an abstract on PAJ (Patent Abstracts of Japan).

Applicants respectfully note that reference A3 was cited by the Japanese Patent Office on the International Search Report dated August 26, 2003. With this response, Applicants are resubmitting a copy of the International Search Report dated August 26, 2003 and an English language copy of the International Search Report. Applicants respectfully request that the next Office correspondence include a signed and initialed copy of the PTO/SB/08 form submitted with the Information Disclosure Statement of November 12, 2004.

In addition, an Information Disclosure Statement and PTO/SB/08 form were submitted on April 30, 2008 but a signed and initialed copy of this PTO/SB/08 has not been provided. Applicants respectfully request that the next Office correspondence include a signed and initialed copy of the PTO/SB/08 form submitted with the Information Disclosure Statement of April 30, 2008.

Rejection under 35 U.S.C. § 103

Claim 6 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 3,015,558 Grant *et al.* (hereafter "Grant") as allegedly evidenced by "Material Hardness", in view of U.S. Patent No. 6,503,345 to Klarstrom (hereafter

“Klarstrom”). Applicants respectfully traverse this rejection for at least the reasons set forth below.

Grant, Material Hardness, and Klarstrom, whether taken individually or in combination, fail to teach or suggest a cutter comprising a Ni-Cr alloy “wherein a moving distance of the cutter required for completely cutting a hemp rope is doubled or less compared with an initial state of the cutter even after 1,000 cut operations are performed when a rope cut test is performed under conditions that a linear blade part of the cutter is pressed on a hemp rope having a diameter of 10 mm and the cutter is reciprocated in the horizontal direction while a load of 2 kg is applied to the cutter whereby the moving distance of the cutter required for completely cutting the hemp rope is repeatedly measured,” as recited in claim 6. For at least this reason, Applicants submit that the outstanding rejection does not properly apply to amended claim 6 and ought to be withdrawn.

Applicants note that claim 6 comprises base Ni, Cr, and Al as well as other elements such as Mg, Ca, B, and rare earth element in the amounts recited in claim 6. The recited amounts of Mg, Ca, B, and rare earth element added to the Ni-Cr-Al type alloy for the cutting tool provide a cutting tool excellent in hot workability. These elements provide deoxidization and desulfurization effects and can be used as additives to improve the hot workability. In this regard, Applicants wish to direct the PTO’s attention to the second paragraph on page 13 of the originally filed specification.

The excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. As a result, excellent cutting properties can be maintained for a long time period as evidenced by the cut test discussed in the present specification.

For example, Figure 5 of Applicants’ application demonstrates that alloys having a composition of 33 mass % Cr, 38 mass % Cr, and 43 mass % Cr, with each having an aluminum content of 3.8 % Al and balance Ni, have superior cutting performance than alloys with the same aluminum content and balance Ni but 31 mass % Cr and 45 mass % Cr. Figure 6 of Applicants’ application demonstrates that alloys having a composition of 38 mass % Cr and balance Ni with aluminum contents of 2.4, 3.8, 4.9, and 5.7 mass % Al have superior

cutting performance to alloys with 38 mass % Cr and balance Ni, but with 2.2 mass % Al and 6.3 mass % Al.

The Mg, Ca, B, and rare earth elements can promote a uniform aging precipitation reaction, so that aging temperature of the is lowered. As a result, the cutter made from the alloy exhibits excellent hardness and high toughness.

Also, when these elements are added to the alloy, a sensibility of the alloy with respect to a hot-working temperature can be effectively lowered. Namely, the amounts of P, O, and S segregated in the grain boundary can be reduced by the deoxidization and desulfurization effects of the added elements, so that it becomes possible to suppress crack-formation in the Ni-Cr-Al type alloy at the time of hot working process. As a result, it becomes possible to perform a stable hot-working operation even if a degree of accuracy of controlling the hot-working temperature is low.

Further, because the claimed amounts of P, O, and S are reduced by the above process, defects and damage caused by intervening substances originated from P, O, and S can be greatly reduced at the time the work is polished. In this regard, Applicants wish to direct the PTO's attention to the second paragraph on page 12 of the originally filed specification. When the elements selected from G, P, O, S, Cu, Si, and Mn are added to the base alloy at predetermined contents, they can effectively decrease cracks generated during working. The addition of a trace amount of Si improves corrosion resistance and the hardness of the alloy. Manganese improves the hot workability.

Turning to Grant, Applicants note that Grant fails to recognize that excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. Grant also fails to recognize that, as a result, excellent cutting properties can be maintained for a long time period as evidenced by the cut test.

Further, Applicants note that Grant describes a relation between heat treatment and hardness of the resultant alloy. However, Grant fails to describe suitable contents of impurities for the cutter. Namely, Grant merely discloses an alloy having a composition of 28-45% Cr, 1-6% Al, and the balance of Ni.

In addition, the remaining references neither disclose nor suggest the preferable composition of the Ni-Gr-Al type alloy for the purpose of improving the hot-workability of the Ni-Cr-Al type alloy used in the presently claimed invention. Nor do the references disclose or suggest a concept of optimizing the amount of P, O, and S for the purpose of solving the problem caused at the time of polishing work.

Applicants note that the PTO suggested that Karlstrom teaches a nickel-base alloy composition and describes that P, O, and S are undesirable alloying elements that are usually present in alloys up to 0.1 %, and, on this basis, has suggested that it would have been obvious that the alloy of Grant would have P, O, and S in the claimed composition, since Karlstrom teaches that these elements are usual impurities in nickel alloys.

Karlstrom, however, at col. 8, lines 37-39 states that "such element may be present in amounts up to about 0.1% without substantial harm to alloys." However, Karlstrom regards a nickel-molybdenum alloy, not a nickel-chromium alloy. The PTO has not addressed how the teachings of impurities elements in a nickel-molybdenum alloy are applicable to any possible impurities in a nickel-chromium alloy.

In addition, Karlstrom provides no description of what the substantial harm could be, and, in addition, does not disclose a concrete usage of the resultant alloy. Karlstrom fails to discuss any influence of P, O, and S contained in a cutting tool. When the usage as a cutting tool is taken into consideration, the amount of P, O, and S must be severely restricted the 0.003% or less level, as specified in claim 6. This low level of P, O, and S specified in the presently claimed invention is not disclosed or suggested by Karlstrom.

Even if the alloy of Grant were combined with the alloy containing the amount of P, O, and S discussed in Karlstrom, this would not result in the presently claimed cutting tool. The presently claimed invention, in contrast to the cited references, is directed to an alloy for a cutter comprising a composition of 32-44% Cr, 2.3-6% Al, and a balance of Ni. When the amount of Cr is less than 32% or larger than 44%, the blade durability is lowered and a sufficient cutting property cannot be obtained. Further, when the amount of Al is less than 2.2% or larger than 6%, the blade durability deteriorates, and the alloy is not suitable for use as cutter material.

In addition, the presently claimed cutter comprises at least one element selected from the group consisting of Mg, Ga, B and rare earth element in the specified amount. The cutter

has excellent hot workability. This excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. As a result, an excellent cutting property can be maintained for a long time period as evidenced by the cut test as specified in the amended claim 1.

In this connection, the PTO suggested that "[i]f the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present". However, in general, the hardness of the alloy is determined by not only composition of the alloy but also heat treatment for the alloy. One of ordinary skill in the art understands that the physical properties of an alloy can vary greatly due to heat treatment conditions. Thus, Applicants submit that the PTO's rationale with respect to this point is flawed and that a person skilled in this art would recognize that alloys having similar compositions could have very different structures and properties.

In the cutting tools, not only high hardness of the alloy but also the reduction of crack-formation in the alloy structure effectively contribute to improve the blade durability. These points are neither recognized nor discussed in any of the documents cited in the outstanding rejection.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection under § 103.

In addition, Applicants note that the present response is being filed with a Request for Continued Examination (RCE) with a suspension of prosecution for three months while Applicants evaluate the feasibility of performing and, if feasible, performing additional experiments to collect additional data for a declaration.

CONCLUSION

Applicant submits that the present application is now in condition for allowance. Favorable reconsideration of the application is respectfully requested.


The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment,

to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 7/23/09

By 

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/06025

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.⁷ C22C19/05, B26B9/00, B26D1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.⁷ C22C19/05

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Jitsuyo Shinan Toroku Koho	1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 1-156445 A (Toshiba Corp.), 20 June, 1989 (20.06.89), Claims; page 2, upper right column, line 12 to lower left column, line 18 (Family: none)	1, 2, 7-10 3-6
A	JP 64-73059 A (Seiko Instruments Inc.), 17 March, 1989 (17.03.89), (Family: none)	1-10
A	JP 59-40902 B2 (Toshiba Corp.), 03 October, 1984 (03.10.84), (Family: none)	1-10

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not

considered to be of particular relevance

"E" earlier document but published on or after the international filing

date

"L" document which may throw doubts on priority claim(s) or which is

cited to establish the publication date of another citation or other

special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other

means

"P" document published prior to the international filing date but later

than the priority date claimed

"T"

later document published after the international filing date or

priority date and not in conflict with the application but cited to

understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be

considered novel or cannot be considered to involve an inventive

step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be

considered to involve an inventive step when the document is

combined with one or more other such documents, such

combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

11 August, 2003 (11.08.03)

Date of mailing of the international search report

26 August, 2003 (26.08.03)

Name and mailing address of the ISA/

Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

A. 発明の属する分野の分類 (国際特許分類 (IPC))

Int. Cl⁷ C22C 19/05, B26B 9/00, B26D 1/00

B. 調査を行った分野

調査を行った最小限資料 (国際特許分類 (IPC))

Int. Cl⁷ C22C 19/05

最小限資料以外の資料で調査を行った分野に含まれるもの

日本国実用新案公報 1922-1996年
 日本国公開実用新案公報 1971-2003年
 日本国登録実用新案公報 1994-2003年
 日本国実用新案登録公報 1996-2003年

国際調査で使用した電子データベース (データベースの名称、調査に使用した用語)

C. 関連すると認められる文献

引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
X A	JP 1-156445 A (株式会社東芝) 1989. 06. 20, 特許請求の範囲, 第2頁右上欄12行-左下欄18行(ファミリーなし)	1, 2, 7-10 3-6
A	JP 64-73059 A (セイコー電子工業株式会社) 1989. 03. 17 (ファミリーなし)	1-10
A	JP 59-40902 B2 (株式会社東芝) 1984. 10. 03 (ファミリーなし)	1-10

☐ C欄の続きにも文献が列举されている。☐ パテントファミリーに関する別紙を参照。

* 引用文献のカテゴリー

「A」 特に関連のある文献ではなく、一般的技術水準を示すもの
 「E」 国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの
 「L」 優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献 (理由を付す)
 「O」 口頭による開示、使用、展示等に言及する文献
 「P」 国際出願日前で、かつ優先権の主張の基礎となる出願

の日の後に公表された文献

「T」 国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの
 「X」 特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの
 「Y」 特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの
 「&」 同一パテントファミリー文献

国際調査を完了した日

11. 08. 03

国際調査報告の発送日

26.08.03

国際調査機関の名称及びあて先

日本国特許庁 (ISA/JP)
 郵便番号100-8915
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特許庁審査官 (権限のある職員)

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